

**NEW MEDICAL/PHYSICAL STANDARDS FOR
FREDERICK COUNTY FIREFIGHTERS**

STRATEGIC MANAGEMENT OF CHANGE

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ABSTRACT

Frederick County Department of Fire/Rescue Services did not have medical/physical standards for its firefighters beyond the most basic medical examination required of all county employees. The purpose of this paper was to investigate medical/physical standards for firefighters and to evaluate new medical/physical standards for Frederick County firefighters.

The methodology used included a literature review of the relevant literature in the National Fire Academy's (NFA) Learning Resource Center ((LRC) and in the library of the Frederick County Department of Fire/Rescue Services. Current national and jurisdictional medical/physical standards were also reviewed. Subsequently, the new medical/physical standards for Frederick County were evaluated. Evaluative research was used to answer the following questions:

1. What medical/physical standards currently exist at the national, jurisdictional, and local levels?
2. Should a physical agility test be included in medical/physical standards for incumbent firefighters?
3. What is the current medical/physical health of firefighters in Frederick County, and what are the physical agility test results to date for Frederick County firefighters?
4. What are the new medical/physical standards for Frederick County firefighters?

Procedures involved comparing and contrasting various medical/physical standards and applying them to Frederick County's fire/rescue services.

The results revealed that firefighter medical/physical standards must be the same for the incumbents and new hires alike. Jurisdictions must establish and ensure minimum physical requirements that are job-related and necessary for efficient performance of firefighter duties. Additionally, the results indicated that Frederick County's new firefighter medical/physical standards, including physical agility test, compared favorably with the national and jurisdictional standards surveyed. Finally, Frederick County should consider implementing a physical fitness program to promote firefighter wellness.

It was recommended that Frederick County continue with implementation of its new medical/physical standards that are the same for new hires and incumbents alike.

TABLE OF CONTENTS

	PAGE
Abstract	167
Table of Contents.....	169
Introduction	171
Background and Significance.....	171
Literature Review	172
Procedures	177
Results	179
Discussion	184
Recommendations.....	187
References	189

APPENDIX

Appendix A – Policies and Procedures, Frederick County, Maryland	199
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TABLES

Table 1 - Comparison of Medical/Physical Minimum Requirements	193
Table 2 - Comparison of Agility Tests.....	194
Table 3 - Frederick County Physical Agility Test.....	195
Table 4 - Summary of 1996 Medical Examinations for Frederick County Career Firefighters (N-36)	196
Figure 1 - Physical Agility Test Results	197
Figure 2 - Physical Agility Test Results	198

INTRODUCTION

Frederick County Department of Fire/Rescue Services did not have medical/physical standards for its firefighters beyond the most basic medical examination required of all County employees. The purpose of this paper was to investigate medical/physical standards for firefighters and to evaluate new medical/physical standards for Frederick County firefighters.

The methodology used included a literature review of the relevant literature in the National Fire Academy's (NFA) Learning Resource Center (LRC) and in the library of the Frederick County Department of Fire/Rescue Services. Current national and jurisdictional medical/physical standards were also reviewed. Subsequently, the new medical/physical standards for Frederick County were evaluated. Evaluative research was used to answer the following questions:

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2. Should a physical agility test be included in medical/physical standards for incumbent firefighters?
3. What is the current medical/physical health of firefighters in Frederick County, and what are the physical agility test results to date for Frederick County firefighters?
4. What are the new medical/physical standards for Frederick County firefighters?

BACKGROUND AND SIGNIFICANCE

Ever since Frederick County employed its first firefighters in 1988, annual medical examinations were required of all career and part-time firefighters. The medical examination consisted of the basic County medical examination required of all new hires, plus several additional items for firefighters, such as multichem, EKG, and spirometry.

The only physical requirements for career firefighters were that they pass a physical agility test at the time of hire. Part-time firefighters were not required until May 30, 1995, to pass a physical agility test at the time of hire. There were no physical requirements for career or part-time firefighters after the start of employment, except for passing an annual County medical examination.

A summary by the County's contract physician of the 1996 annual medical examination results for career firefighters revealed that only 25 percent passed the examination with no adverse conditions. For example, 75 percent of firefighters experienced an average weight gain of 13 pounds from the previous year. In his report, the County physician bluntly stated that "they (the firefighters) are not a particularly healthy group of people."

As a result of these findings, it was decided by the County's contract physician, the Department of Personnel, and the Department of Fire/Rescue Services that there was an urgent need to develop new medical/physical standards, including physical agility tests, for all incumbent career and part-time firefighters.

Implementing a major organizational change such as new medical/physical standards for firefighters relates to Module 4 "Leading Change Using the Change Management Model" of the *Strategic Management of Change* course (NFA, 1996) of the Executive Fire Officer Program. The module describes the role of fire service executives in leading organizational change, and identifies approaches to reengineering.

LITERATURE REVIEW

National Legislation

A review of related national legislation revealed the importance of medical/physical standards for the fire service. In particular, the Civil Rights Act of 1991, the Americans with Disabilities Act (ADA) of 1991, and the Age Discrimination in Employment Act (ADEA) Amendments of 1996 focus on the need for job-related standards that are based on the essential functions of the position. According to Davis, these legislative directives "...require the development of a physical task-type test evaluating the essential functions of firefighting" (August 1995, p. 20):

Many employers are wary of instituting or enforcing physical standards because of fear of discrimination litigation under the ADA or other state handicap statutes. This fear should be dispelled because the ADA and its regulations clearly recognize the important interest involved in fire and emergency response, thereby allowing employers considerable latitude in setting physical standards so that firefighters can perform their "essential functions," which at times may require extreme physical exertion in fighting a fire or performing a rescue (Lies, 1997, p. 10).

Moreover, whatever physical standards are adopted need to be the same for all firefighters in a department. "...Without the establishment of a single physical standard, under the guidelines of ADA, it would be illegal to refuse potential employment as an emergency responder to any applicant based on a disability" (Godwin, 1996, p. 22).

The ADA requires that medical/physical standards be job-related and consistent with business necessity, which means developing job-related medical/physical standards (Sandler, 1992). "Section 102 (6) (6) of the ADA requires that employers must be able to show that the physical fitness tests are job related and consistent with business necessity" (Snyder, 1991, p. 257). "The ADA does not restrict an employer's ability to ask about the employee's ability to perform job-related functions" (Snyder, 1991, p. 253). For incumbents, a critical ADA issue is ensuring continuing fitness-for-duty, which includes return-to-work procedures (Sandler, 1992).

Another key aspect of the ADA is the provision for reasonable job accommodations. If a physician determines that medical/physical restrictions are necessary, then the employer decides whether the required accommodations are reasonable for the employee's job (Sandler, 1992). In a recent court decision in neighboring Howard County, Maryland, it was determined that an incumbent firefighter with asthma did have a disability, but that the County did not unreasonably fail to accommodate the employee given the nature of firefighting work (Schneid, February 1997).

More recently, the ADEA Amendments of 1996 underscored the importance of measuring physical ability. According to Rukavina (1997), the ADEA has two critical implications for the fire service:

1. ...Physical ability is a better predictor than chronological age (of the ability to do firefighting work). (Therefore,) physical ability should be measured.
2. Once...the measurable point is identified where a firefighter can no longer demonstrate the physical ability to continue as a firefighter, that point of performance would apply to any firefighter, regardless of age or length of career (Rukavina, 1997, p. 22).

In other words, discrimination based on age is not permitted as long as a person is physically able to do the job. The only way to know if a person is physically able to do the job is by measuring physical ability of incumbents throughout their career.

Moreover, the U.S. Department of Health and Human Services (DHHS) and the National Institute of Occupational Safety and Health (NIOSH) have been charged by Congress "...with reevaluating the relationship between age and physical ability and firefighting. (DHHS)...is required to develop guidelines and regulations for nondiscriminatory and valid job performance tests for firefighters...who wish to challenge mandatory retirement standards individually" (Rukavina, 1997, p. 22). By September 2000, NIOSH:

...must develop standards for such physical ability testing. When HHS and NIOSH develop their standards and guidelines, the fire service will use those standards and guidelines to define a minimum acceptable level of physical performance for all incumbent firefighters. Other laws, most notably ADA, authorize--in fact, expect--employers to evaluate the ability of employees to perform the essential functions of a job, with or without reasonable accommodation (Rukavina, 1997, p. 22).

Federal Regulations

Federal regulations also require employers to ensure a firefighter's fitness for duty:

OSHA regulations, in part, require a certain level of physical fitness in order to wear a respirator. Fire service organizations have the legal right and duty to set

reasonable standards for physical fitness for their members and must do so, as evidenced by the Washington and Iowa citations (Lies, 1997, p. 10).

The Washington citation involved the Seattle Fire Department and was based on an OSHA inspection following the highly-publicized Mary Pang fire which caused the death of four firefighters and injuries to others. Alleged violations were based on failures to comply with OSHA and national consensus standards, including NFPA 1500. "...By its authority under the General Duty Clause, OSHA can use national consensus standards to issue citations to employers who do not follow these practices" (Lies, 1997, p. 1). The Iowa citation involved the Sioux City Fire Department and was based on an extensive citation arising out of an explosion and fire at the Terra International Water Nitric Acid Plant. Alleged infractions were based on violations of OSHA's *Hazardous Waste Operations and Emergency Response* (HAZWOPER) standard (29 CFR 1910.120) and *Personal Protective Equipment* (PPE) standard (29 CFR 1910.134).

"Occupational Safety and Health Administration (OSHA 1910.156.b.2) requires the employer to assure that employees who perform interior structural firefighting are physically capable of performing those duties" (Tritz, 1991, p. 14).

OSHA requires that your fire department document that **every** firefighter who performs fire suppression tasks has been determined to be fit to perform fire suppression duties. This evaluation is performed by a physician who is familiar with fire suppression tasks and the working environment (Metropolitan State University, 1996, p. 1).

Tritz goes on to report that having a physical examination is only one way to determine if a firefighter meets the physical capability requirement. Other ways of making the determination are by having the firefighter successfully complete all required training and a job-related physical performance test (Tritz, 1991).

The American National Standards Institute (ANSI z88.6-1984) describes guidelines for physical qualifications for respirator users and recommends an electrocardiogram and some pulmonary function tests. The *Code of Federal Regulations* (29 CFR 1910.120) requires baseline and annual physical exams for fire department employees who respond to hazardous materials incidents (Metropolitan State University, 1996).

In 1992, the Equal Employment Opportunity Commission (EEOC) conducted a study that:

...concluded that age was not a reasonable predictor of employee performance in the fire service: that 'accumulated deficits' in firefighter physical ability were only marginally associated with age. As attitudes change on the issues of diet, exercise, and smoking, it will be increasingly difficult to argue that the fire service can maintain separate standards of physical fitness for new hires and incumbents (Armstrong, et al., 1993, p. 36).

In fact, the overwhelming trend has been toward one standard for firefighters.

National Standards

Several current National Fire Protection Association (NFPA) standards address medical and physical standards. However, "...there is no current NFPA standard or recommended practice on physical fitness, physical performance, or physical assessment" (Marinucci, 1996, p. 6). "In the 1980s, concern over the occupation safety and health of **incumbent** firefighters led to the establishment of NFPA 1500, *Standard on Fire Department Occupational Safety & Health Program*" (Burkman, 1992, p. 24). The 1992 edition of NFPA 1500 contains an entire chapter on medical and physical issues and requires that all fire suppression personnel be medically evaluated periodically as specified by NFPA 1582, *Standard for Medical Requirements for Fire Fighters* (1992). Moreover, Chapter 8-2.1 (1992) of NFPA 1500 requires that fire departments "...develop physical performance requirements for candidates and members who engage in emergency operations." Additionally, NFPA 1500 requires that incumbents "...be annually evaluated and certified by the fire department as meeting the physical performance requirements specified" (Chapter 8-2.4, 1992).

In the Appendix (Section A-8-2.1, 1992), NFPA 1500 describes "critical fire fighting tasks" as "physically demanding" and requiring "muscular strength, muscular endurance, aerobic capacity, flexibility, equilibrium, and anaerobic power." The section goes on to state that "fire departments should include the above noted physical abilities for the evaluation of candidates and incumbent fire fighters."

The 1992 edition of NFPA 1582 covers medical requirements for persons who perform fire fighting tasks that were previously contained in Section 2-2, (1992) of NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, which applied only to the entry level:

On the assumption that a linkage exists between entry level requirements and incumbent job performance, and in an effort to resolve an inter-committee jurisdictional dispute between 1001 and 1500, a joint subcommittee (nominated the 1582 subcommittee) was established to coordinate efforts to draft and revise firefighter medical and physical abilities standards at the entry **and** incumbent levels (Burkman, 1992, p. 24).

However, physical performance standards were eliminated from the 1982 edition of NFPA 1582, and recent efforts to adopt them as part of a separate standard (NFPA 1583) have failed. The only physical fitness standard currently promulgated by NFPA is found in the current NFPA 1001 (1992) which states: "Physical fitness requirements for entry level shall be developed" (Burkman, 1992, p. 28).

"Legal opinion and federal laws show that requirements set for a position must be the same for anyone who would be in that position or is in the position" (NFPA 1582, 1992, p. 1582-1). Therefore, NFPA 1582 is "...intended to apply to candidates as well as current fire fighters" (NFPA 1582, 1992, p. 1582-1). Section 1-3.2 of NFPA 1582 (1992) also states that when the standard is adopted, the jurisdiction "...shall be permitted to establish a phase-in schedule for compliance with specific requirements of this standard in order to minimize personal and departmental disruption." Appendix C of NFPA 1582 (1992) describes in detail the essential

firefighting functions upon which the medical requirements of the standard are based and are shown to be job-related.

NFPA 1582 (1992) recommends treadmill testing every two years for firefighters beginning at age 40, and even more frequently as a firefighter ages thereafter. Those with one or more coronary artery disease risk factors (e.g., hypertension, cigarette smoking, high cholesterol) should receive treadmill testing beginning at age 35. NFPA 1582 only recommends preplacement chest x-rays (Appendix B-3.2, 1992).

NFPA 1583, *Recommended Practices for Fire Fighters' Physical Performance and Conditioning Program*, was proposed to establish guidelines for physical fitness and performance assessments. "The major thrust of the document is directed to the programmatic aspects of fitness, versus the punitive consequences of failure" (Davis, May 1994, p. 51). According to Davis, proposed NFPA 1583 simply expands on NFPA 1500 and "...addresses the next logical issue, performance" (Davis, August 1995, p. 23). NFPA 1583 "...details methods fire departments can use to assess the ability of incumbents and applicants to perform the essential functions of fire suppression" (Davis, October 1995, p. 20). "The 1583 Task Group proposed that the best way to predict success and determine if a candidate possesses the requisite fitness to perform the essential functions of the job is to replicate the job behaviors" (Davis, October 1995, p. 22).

Last year, the NFPA Standards Council considered complaints against the proposed NFPA 1583 and returned the document to the NFPA Health and Safety Technical Committee. "Although originally drafted in response to a request for a standard of physical fitness for fire fighters, the proposed recommended practice focuses on physical performance assessment" (NFPA Standards Council, February 1, 1996, p. 1).

National Membership Organizations

The International Association of Fire Fighters (IAFF) supports wellness and physical fitness programs for firefighters, but appears firmly opposed to any time-based performance testing for incumbents. While Rich Duffy, director of the IAFF's Department of Occupational Health and Safety, concedes that "In almost all cases, management has the right to implement physical fitness testing programs" (1996, p. 8), the official IAFF policy on physical fitness programs, as ratified in 1992, states in part that "any program of physical fitness must...allow for age and position in the department" (1996, p. 1). Duffy goes on to acknowledge later in this article that now, under Federal regulations such as the ADA, "...if tests are used as a condition of employment (for new hires), they then can be used as tests for continuation of employment..." and "...if different tests are used for new hires vs. permanent employees, discrimination can be claimed" (1996, p. 8). Duffy succinctly summarizes the current IAFF position by stating that "Timed, task-based tests do not assure the physical fitness of (IAFF) members..." (1996, p. 16).

International Association of Fire Chiefs (IAFC) President R. David Paulison has adopted firefighter wellness and fitness as "one of the important issues" he wants to work on (1997, p. 6). After discussions with IAFF President Al Whitehead, the IAFC "decided to develop a model (firefighter wellness and fitness) program for ten fire departments" (Paulison, 1997, p. 6):

In December (1996), fire chiefs and fire service labor leaders from 10 North American fire departments met in Phoenix to begin an unprecedented initiative to develop physical fitness and wellness programs for firefighters. The hope of the group was that the 10 departments involved would act as wellness/fitness 'hubs' from which other fire departments could derive information about program development (Dezelan, 1997, p. 56).

Paulison emphasized that the model (wellness and fitness) program "is not setting a physical fitness standard," rather "a wellness program to take care of firefighters" (1997, p. 6). The specifics of the program were to be released at the IAFC's Fire-Rescue International conference in late August 1997. "...organizations such as the NFPA, OSHA and the IAFF all agree that overall, physically fit firefighters are less susceptible to injuries and death in performance of their firefighting duties" (Schmitt, 1994, p. 7). Ostrow cautions, however that:

the role of physical fitness in the fire service is complicated not because folks (such as labor and management) disagree that firefighters are better off if they are fit, but because they are divided about how much responsibility a fire department should bear for the fitness of its members (1997, p. 85).

PROCEDURES

Methodology

Research primarily involved a review of literature from the LRC of the NFA and the library of the Frederick County Department of Fire/Rescue Services. Current national and jurisdictional medical/physical standards were also reviewed.

Various medical/physical standards were compared and contrasted and then applied to Frederick County's fire/rescue services. The objective was to evaluate the new medical/physical standards for Frederick County firefighters and to consider the implementation process.

First, firefighter medical/physical standards at the national level, including NFPA 1582 and the U.S. Department of Transportation's (DOTs) *Physical Qualifications and Examinations of Drivers* were compared and contrasted. Then, firefighter medical/physical standards of a sampling of neighboring jurisdictions including Montgomery County, Maryland, and Fairfax County, Virginia, were compared and contrasted. Finally, the old Frederick County medical/physical standards were described.

Second, the issue of a physical agility test as part of medical/physical standards was addressed. A sampling of physical agility tests found in the literature review was compared and contrasted. A sampling of physical agility tests from neighboring jurisdictions was compared and contrasted as well.

Third, the current medical/physical health of Frederick County firefighters was reviewed, based on the results of the 1996 medical examinations of 36 Frederick County career firefighters. The results of the Frederick County physical agility test for new hires since 1988 were researched and reviewed as well.

Finally, the new medical/physical standards for Frederick County firefighters were reviewed and compared with the Montgomery County, Maryland, medical/physical standards, upon which the Frederick County standards are based.

Limitations

The project's results were limited to a sampling of jurisdictions found in the literature review and to a sampling of jurisdictions neighboring Frederick County. Use of a survey form may have provided additional data for a broader based evaluation of medical/physical standards, particularly of jurisdictions surrounding Frederick County.

The summary of the current medical/physical health of Frederick County firefighters did not include the results of five career firefighters, which were not available for a variety of reasons, including vacancies, and recent hires who were not included in the summary. More significantly, the summary did not include the results of approximately 120 part-time firefighter physicals, which would have provided a much larger sample. The county's contract physician had not prepare a similar summary for part-time firefighters. Given more time, such a summary also might have been available.

The physical agility test results only included the results for new hires since 1988. Results prior to 1988 were unavailable, but represented a small number. Candidates for part-time firefighter were not required to pass the physical agility test until 1995. Therefore, results included career candidates only from 1988 to 1995. More significantly, there were few results for incumbent firefighter agility testing since it was not required.

Definition of Terms

Body Fat Content (Composition)--The ratio of fat to lean muscle. Essential Tasks (ADA)--A task or series of tasks that defines the unique purpose for which the person is employed. Risk Factor--An identifiable trait or behavior that is correlated with an increased incidence of a disease. Validity--Demonstrating a relationship between a criteria (the job) and performance indicators (the test). Valid Physical Performance Standards--The minimum amount of physical fitness needed to fight fires and rescue victims.

RESULTS

Answers to Research Questions

1. What medical/physical standards currently exist at the national, jurisdictional, and local levels?

Firefighter medical/physical standards at the national level include NFPA 1582 and the U.S. DOT's *Physical Qualifications and Examinations of Drivers*. (See Table 1.) The DOT standards are required for firefighters who possess a commercial driver's license. Firefighters in Maryland, however, are not required to possess a commercial driver's license.

Both the NFPA and DOT standards are organized by body function and indicate minimum requirements as well as guidance regarding conditions that may be a problem. NFPA breaks down the medical conditions as "Category A" and "Category B." A "Category A" Medical Condition precludes a person from performing as a firefighter, whereas a "Category B" Medical Condition, based on its severity or degree, may preclude a person from performing as a firefighter.

Both the NFPA and DOT standards have few conditions that would automatically disqualify a firefighter. For vision, NFPA 1582 (1992) specifies far visual acuity as at least 20/30 binocular corrected with contact lenses or spectacles, whereas DOT requires distant binocular acuity of at least 20/40 in both eyes with or without corrective lens.

Unlike the 1992 edition, the newly revised 1997 edition of NFPA 1582 to be issued in 1997, does not include any "Category A" Medical Condition for ears and hearing. However, the DOT standards require a minimum average hearing loss in the better ear of 40 decibels at 500 Hz, 1,000 Hz, and 2,000 Hz.

While NFPA 1582 (1992) has no minimum requirements regarding blood pressure, the DOT standards indicate that further tests may be necessary for drivers with blood pressures consistently above 160/90. Finally, DOT requires annual physical examinations for commercial drivers, while NFPA 1582 (1992) only requires an annual medical examination for firefighters age 40 or over. Firefighters ages 30 to 39 receive a medical examination every 2 years, and firefighters ages 20 to 29 receive a medical examination every 3 years. However, all firefighters are recommended to receive a lesser medical evaluation at least annually.

A sampling of neighboring jurisdictions included Montgomery County, Maryland, and Fairfax County, Virginia. (See Table 1.) For vision, Montgomery's minimum far visual acuity was the same as NFPA 1582 (20/40 corrected binocular). Fairfax's minimum retention standard for far visual acuity was 20/40 corrected in each eye. For hearing, the Montgomery and Fairfax minimum requirements were nearly identical to NFPA 1582 (1992 edition), 25 decibels at 500 Hz, 1,000 Hz, and 2,000 Hz.

Regarding weight, Fairfax uses a height/weight chart, or 18 percent body fat content for males and 25 percent body fat content for females. Montgomery handles weight problems on a case-by-case basis.

Like the DOT standards, Fairfax references a consistently high blood pressure of 160/110 as cause for further evaluation of a firefighter. The Montgomery standards have no such specific reference. Whereas Montgomery requires the treadmill test for new hires only, Fairfax calls for the treadmill test for incumbents on a case-by-case basis.

Unlike the NFPA and DOT standards, both Montgomery and Fairfax require periodic chest X-rays for incumbents. Montgomery requires them every 5 years, while Fairfax requires them every 2 years for ages 40 and over and every 3 years for ages 39 and under.

Medical/Physical retention standards for new hires and incumbents under NFPA 1582 (1992) are the same, whereas they are different for Montgomery and Fairfax. Physical agility testing is required of incumbents in Fairfax, is specified for new hires only in Montgomery, and is not required under NFPA 1582 (1992). The schedule for medical examinations is the same for Montgomery, Fairfax, and NFPA 1582 (1992).

Frederick County has new medical/physical standards for firefighters that are most similar to those of Montgomery County. Previously, Frederick County did not have any standards beyond the basic County medical examination for all employees and several additional procedures that were administered to all incumbent firefighters on an annual basis. The additional procedures for County firefighters included PPD, multichem, EKG, spirometry, color perception, body fat analysis, and a comparison with previous medical examinations.

2. Should a physical agility test be included in medical/physical standards for incumbent firefighters?

Research revealed that the physical agility test required of Frederick County incumbents was quite similar to agility tests required of incumbents and new hires alike in other jurisdictions. In fact, agility tests were found to have been an integral part of new hire testing in all jurisdictions surveyed.

A comparison of agility tests found that all had similar, often the same, basic components that were task-oriented and job-related. (See Table 2.) Common tasks included all those found in the new Frederick County Physical Agility Test: raising a ground ladder, rescuing a dummy, and swinging a hammer. Even the two tasks in the old Frederick County physical agility test that were changed--loading containers and climbing a ladder--were found in other tests. (See Table 3.)

The new City of Alexandria, Virginia, Fire Department Job Based Performance Exercise for incumbents includes the same basic elements as the new Frederick County Physical Agility Test for incumbents. The Alexandria Exercise has a "charged hose line drag" instead of an uncharged hose line pull up the side of a building and includes an additional "hose stream target

backstop" task. The Alexandria dummy at 175 pounds weighs considerably more than Frederick County's dummy at 117 pounds.

There are some similarities between the Frederick County Physical Agility Test and the Combat Challenge, but also some significant differences. Each has five tasks, and four of the five tasks are quite similar. Frederick County has a ladder raise, while the Combat Challenge has a hose stream target backstop. Participants wear self-contained breathing apparatus (SCBA) in both tests, but only wear the facepiece and use breathing air in the Combat Challenge. As in Alexandria, the dummy in the Combat Challenge at 175 pounds is significantly heavier than the Frederick County dummy at 117 pounds. Finally, the time allowed for completion of all tasks for Frederick County is 10 minutes, 43 percent longer than for the Combat Challenge time limit of 7 minutes.

Regarding incumbent firefighter opinion of physical agility testing, a survey conducted by Ravenelle (1994) of 58 shift personnel of the Hobbs, New Mexico, Fire Department found that 40, or 69 percent, believed there should be no variation in passing levels due to age or gender. Moreover, Schneider noted that "Nothing was found in the research (he conducted) that suggests that (physical agility) tests should not be used" (1993, p. 13).

Schneider (1993) conducted a survey of 35 fire departments in Missouri and found that 29 (83 percent) believed that requirements for physical agility testing of incumbents should not be adjusted for age, and only 6 (17 percent) believed there should be some adjustment for age. The survey also found that 12 (34 percent) departments test periodically after hire for continuing physical fitness and agility and 23 (66 percent) do not.

3. What is the current medical/physical health of firefighters in Frederick County, and what are the physical agility test results to date for Frederick County firefighters?

A summary of the 1996 medical examinations for career firefighters in Frederick County revealed a number of unhealthy trends. (See Table 4.) Only 9 (25 percent) of the 36 firefighters examined passed with no adverse conditions. Weight increased an average of 13 pounds for those with a weight gain, from a low of a 2-pound increase to a high of a 37-pound increase. The total weight gain for the group was 221 pounds from the previous year. Only one person had a weight decrease (13 pounds).

Five had a body fat content of greater than 30 percent, with one person as high as 44 percent. Three had high blood pressure, nine had high cholesterol, and two had elevated glucose levels.

The 64 physical agility test results for new hires since 1988 revealed that 52 passed (81 percent) and 12 failed (19 percent). If re-attempts by the same person are removed, the number who ultimately failed decreased to 9 (15 percent), which increases the passing rate to 85 percent.

Of the 9 women who attempted the test, only 2 (22 percent) passed and 7 (78 percent) failed. One female candidate failed a first and second attempt on one day, and passed a third attempt two months later.

An analysis of times for completion of these physical agility tests revealed no apparent linear relationship between firefighter age and time. In other words, the sample showed that completion times did not increase with age. Figure 1 is a scattergraph that plots firefighter completion time by age. Ages ranged from 22 to 50 years. Eight of the times were for incumbents, and two of the times were for female candidates. The sample does not include the eight candidates who failed the test, including seven females and one male.

Figure 2 is a bar graph that indicates the number of firefighters by completion time for the physical agility test. The majority of firefighters (63 percent) completed the test between 6 minutes and less than 8 minutes. Only one firefighter successfully completed the test in more than 10 minutes. For the 57 completion times that were available, the average time was 7 minutes, well below the maximum time allowed of 11 minutes. Finally, in all the tests administered by Frederick County, only one firefighter failed the test due to exceeding the 11-minute time limit. The other seven who failed the test were unable to pass a particular task.

4. What are the new medical/physical standards for Frederick County firefighters?

Development of medical/physical standards for Frederick County firefighters were in process when research for this paper began. The newly adopted Frederick County policies and procedures for firefighter medical/physical standards may be found in Appendix A. This applied research project allowed the author the chance to compare these adopted standards with current research.

Frederick County medical/physical standards for firefighters were based on the current Montgomery County, Maryland, standards. Although a much larger jurisdiction in population, Montgomery County firefighters are cross-trained and function similarly to Frederick County firefighters. Montgomery County standards were selected with modifications after a review of standards and requirements from Montgomery County, Fairfax County, Virginia, NFPA 1582, and U.S. DOT *Physical Qualifications and Examinations of Drivers*.

One of the key aspects of the Frederick County standards was that medical/physical standards for entry-level and incumbent firefighters should be the same. Some of the specific medical standards were as follows:

1. Weight Standards--Frederick County adopted the Body Mass Index (BMI) as the assessment tool for body weight. BMI is body weight in kilograms divided by height in meters squared. While Montgomery County standards simply specified that weight be handled on a "case-by-case" basis, Frederick County desired to have a specific and measurable standard as well.

Federal guidelines suggest that individuals should maintain a BMI less than 25, and this was the goal Frederick County adopted for Frederick County firefighters. Those with BMIs of 25 or more receive counseling from the County physician.

2. Vision Standard--Frederick County adopted a vision standard that visual acuity must be corrected to 20/30 binocular or better. Unlike the other standards, Frederick County decided not to adopt any minimum for uncorrected vision.

3. Hearing Standard--Frederick County adopted the Montgomery County hearing standard as written.

4. Treadmill Standard--As with Montgomery County, Frederick County decided to require a treadmill test for all new hires. Unlike Montgomery County, Frederick County adopted specific standards for incumbents. The treadmill test is administered annually for firefighters age 40 and older, and on a case-by-case basis for firefighters younger than age 40.

5. Chest X-ray--Frederick County adopted the Montgomery County chest X-ray standard as written.

6. Physical Examination Schedule Standard--Frederick County adopted the Montgomery County physical examination schedule as written.

7. Vaccine Standard--Frederick County included its previously adopted vaccine standard as part of its medical/physical standards.

8. Physical Agility Standard--Perhaps the most significant change from the Montgomery County standards was the adoption of a physical agility standard for new hires and incumbents alike. Testing was based upon a validated job analysis of incumbent Montgomery County firefighters that identified the degree of physical ability required to perform critical tasks. The physical agility test adopted is the same as Montgomery County's test for new hires, but in Frederick County it is required annually of all incumbents. The purpose of the testing is to determine an individual's physical or functional ability to perform the essential physical demands of the job and to reduce the probability of work-related disabilities. Specific tasks include a ladder extension, a hose carry, a hose pull, a dummy rescue, and chopping. Within a ten-minute time limit, the tasks are completed sequentially in full turn-out gear while wearing, but not using, SCBA.

Regarding implementation, career firefighters who fail the initial medical examination under the new standards will be counseled and given a maximum of one year until re-examination. Career firefighters who are still deemed by the County physician to be medically unacceptable after a maximum of one year from the initial examination will be separated from service. Part-time firefighters who fail the medical examination will be separated from service. Career and part-time firefighters who fail the initial physical agility test and subsequent retest within six months will be separated from employment.

DISCUSSION

The importance of medical/physical standards for firefighters is highlighted vividly by a review of firefighter fatalities nationally. NFPA reports the following: "The leading cause of fatal injury for on-duty firefighters in 1996 was, in fact, stress, as it has been in almost every year of this 20-year study, and this stress usually resulted in heart attacks" (Washburn, et al., 1997, p. 48). In 1996, there were 92 on-duty firefighter deaths, of which 50 percent were caused by stress resulting in a fatal heart attack. For career firefighters, 69 percent of the deaths from heart attacks only occurred in firefighters between the ages of 41 and 55. Of the 532 heart attack deaths over the past 20 years for which documentation is available, 50 percent had had previous heart attacks or bypass surgery, 33 percent had severe arteriosclerotic heart disease, and 12 percent had hypertension or diabetes. Therefore, up to 95 percent of the heart attack deaths may have been prevented with proper medical and physical testing, which would have dropped the number of 1996 firefighter deaths by nearly half.

Proper medical and physical screening is even more important for older firefighters. "Approximately three-quarters of the firefighters over age 45 who died in 1996 died of heart attacks" (Washburn, et al., 1997, p. 49). It could be argued that any attempt to lower medical/physical standards for incumbent firefighters based on age would not only be illegal and unfair to younger incumbent firefighters, but could actually be a life-threatening disservice to older incumbent firefighters:

Properly screening fire service applicants, making sure they meet fitness requirements throughout their careers, and testing their health annually are essential if they're to be ready for the stress of duty--and if we're to reduce the number of fatal heart attacks that firefighters continue to suffer on duty each year (Washburn, et al., 1997, p. 52).

One of the key issues related to the new medical/physical standards for Frederick County firefighters is whether the physical agility test for incumbents should be different from the physical agility test administered to new hires. The research clearly reveals that the tests must not be different and, in fact, must be the same for new hires and all incumbents alike. "Many fitness and agility tests presently used by public safety agencies are scored based on the employee's age, or gender, or both. Such tests will be difficult to defend against a challenge brought under the ADA" (Snyder, 1991, p. 262). "...Physical requirements cannot be reduced because of increased age because the job requirements do not change; the need for physical ability remains the same" (Schneider, 1993, p. 11). Frederick County's medical/physical standards attempt to establish a reasonable **minimum** that all incumbent firefighters need to meet to perform their duties effectively.

Another key issue is concern that the physical agility test is dangerous or might lead to the injury, death, or forced retirement of incumbents. Again, Frederick County's agility test is designed as a reasonable minimum requirement that all incumbents need to meet. "Without some type of medically approved physical testing, neither the department nor the firefighter may understand the firefighter's true physical ability" (Siegfried, 1995, p. 34). No one can deny that

maintaining and assuring a firefighter's physical ability is essential to the performance of a firefighter's duties.

By requiring a thorough medical evaluation and/or examination before each test, Frederick County is attempting to screen any incumbent who might be medically at risk before attempting the agility test. However, deaths can occur even during monitored stress tests and physical fitness activities. "The NFPA's in depth study of 503 fire fighter deaths over past 10 years showed that...11 of those deaths occurred during physical fitness activities or undergoing stress tests" (Siegfried, 1995, p. 34). While any firefighter death is tragic, these 11 deaths represent only 2 percent of the deaths over the 10 years, and without medical and physical screening, these deaths may have occurred during an emergency response with even more unfortunate results.

Following the violence that cancelled the Firefighter Combat Challenge at the IAFC's annual conference in Kansas City, Kansas, in August 1996, *Fire Chief* magazine editor Scott Baltic wrote a strong editorial regarding labor's opposition to fitness testing and questioned what is the meaning of physical fitness, or anything else, without testing. Like Baltic, Frederick County believes that fitness testing is necessary and, in fact, required, and recognizes that "...the chronically unfit not only will, but should, lose their jobs" (1996, p. 7). Those who are unfit are a danger to themselves and to others.

Godwin states succinctly what is also Frederick County's position regarding its new medical/physical standards: "...the ultimate goal for all employees (is) to meet a single standard in a reasonable timeframe and with adequate support" (1996, p. 23). Perhaps, however, Frederick County may need to evaluate further if it is providing "adequate support" to its employees in meeting the new medical/physical standards. Godwin goes on to state a simple premise that "...if the (physical) standards are reasonably correct, there should be only two reasons why an incumbent employee fails. Lack of preparation or an underlying medical condition which may prove hazardous to the employee" (1996, p. 20). With its new medical/physical standards, Frederick County has provided its employees with preparation time and with a thorough medical screening. Therefore, if an employee is medically fit and is prepared to meet the essential functions of the job, there should be no reason the employee does not successfully meet or exceed the new medical/physical standards.

Another issue was whether to adopt another jurisdiction's medical/physical standards. According to Schmitt, "Adopting a (physical fitness) program in use by another department proved to allay the fears of our (Pensacola Fire Department) firefighters seeing the program in active use by another fire department" (1994, p. 23). In Frederick County's case, the medical/physical standards of Montgomery County, Maryland, were adopted with some modifications. Montgomery's physical agility test has been in use for many years and has been used by Frederick County for new hires since at least 1988. Many of Frederick County's part-time firefighters work as career firefighters in Montgomery County or other neighboring jurisdictions that have operations similar to Frederick County, and have for years used successfully task-based physical agility tests. While Montgomery has not yet started using a task-based test for incumbents, other neighboring jurisdictions such as Alexandria and Fairfax

County, Virginia, are using such tests. Again, the research clearly shows that such testing is necessary for firefighters.

In its 1993 publication *A Handbook on Women in Firefighting*, the organization Women in the Fire Service (WFS) stresses the importance of "linkage," which refers to linking the entry-level performance standard with the incumbent's level of performance. "The lowest level of acceptance and effective incumbent performance is the standard for applicant performance" (Armstrong et al., 1993, p. 35). Since Frederick County requires, and has required for years, a physical agility test for all new hires, it is imperative that incumbents meet this level of performance, which can be measured by the same type of testing. Otherwise, Frederick County must discontinue administering a physical agility test to all new hires. Regarding linkage, WFS makes a final point: "Most importantly, linkage of entry-level standards to on-the-job performance leads to the development of a single performance standard for all firefighters within a department" (Armstrong, et al., 1993, p. 35). Frederick County is attempting to accomplish this goal by implementing medical/physical standards that are job-related and reasonable for new hires and incumbents alike.

One question that arises is whether Frederick County should assess performance by use of fitness testing or a physical agility test. "Since many of the essential functions of a firefighter can be closely simulated, such tests (that simulate job tasks) are most likely to stand up to challenge under the ADA" (Snyder, 1991, p. 266). No discrimination can be claimed under ADA if the test is job-related and consistent with business necessity.

One concern with Frederick County's physical agility test is the disproportionate number of female candidates who have failed the test. "Whatever the type of test used, where there is disparate impact, the test may be challenged in court, and the fire department using the test bears the responsibility of defending it" (Armstrong, et al., 1993, p. 36). However, Davis cautions that "...to lower standards undermine(s) the accomplishments of those women who have achieved success on their own merits" (1996, p. 32). While Frederick County should always strive to minimize any disparate impact, it should not fail to ensure a minimum level of job-related performance standards.

In the 1996 *Wingspread IV Conference Report of The International Association of Fire Chiefs Foundation*, one of the critical issues identified in the fire service is firefighter wellness. "Historically the fire service has known more about the apparatus than the firefighters who use that equipment" (1996, p. 7). In 1986, a physician who worked with the Seminole County, Florida, Fire Department observed that: "Every modern firefighting department places a great deal of emphasis on preventive maintenance of equipment but paradoxically seems to ignore that fundamental need when it comes to people (Newman & Malone, 1986, p. 38.) Given the current medical and physical condition of its firefighters, these statements certainly seem true for Frederick County.

Davis states that "...a fitness program can reduce by one-half the incidence of on-the-job injuries. In fact, it's probably the single most effective intervention strategy in creating a safe work force, eclipsing all the other occupational safety initiatives of NFPA 1500" (January 1997, p. 19). The *Wingspread* section on wellness cautions that fire service organizations "...must

overcome the historic punitive mentality of physical fitness, move beyond negative timed, task-based testing and toward progressive improvement..." (1996, p. 7). "Firefighters have a professional responsibility to stay fit, and their departments have a responsibility to support them" (O'Connor, April/May 1996, p. 22). With this challenge, it is obvious that Frederick County, and probably most other fire service organizations, can and should do a better job with ensuring firefighter wellness along with effective firefighter performance.

RECOMMENDATIONS

It is recommended that Frederick County continue with implementation of its new medical/physical standards that are the same for new hires and incumbents alike. However, it is also recommended that Frederick County take the following actions:

- Compare the new medical/physical standards with the revised, 1997 editions of NFPA 1500 and NFPA 1582 released in September 1997, and consider any changes to the standards.
- Meet with the new contract physician for Frederick County as soon as the contract is awarded in September 1997, thoroughly review the new medical/physical standards, and consider any changes to the standards.
- Arrange at least one meeting with the contract physician and the firefighters to explain the new standards and to answer questions.
- Establish a health/safety/fitness committee to assist with implementing the new medical/physical standards, including administration of the physical agility test.
- Establish a mechanism to receive continuous feedback from the employees and to provide timely information.
- Maintain statistics on the number of firefighter accidents and illnesses and document any trends after implementation of the new medical/physical standards.
- Use physical fitness coordinators to assist firefighters with achieving and maintaining fitness.
- Consider the development and implementation of a physical fitness program to complement and facilitate implementation of the new medical/physical standards for Frederick County firefighters.

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Table 1
Comparison of Medical/Physical Minimum Requirements

Item	Fairfax (1984)	Montgomery (1992)	NFPA (1992)	DOT (1995)
1. Vision				
<u>Corrected:</u> each eye	20/40 (retention)	N/A	N/A	N/A
binocular	N/A	20/30	20/30	20/40
<u>Uncorrected:</u> each eye	20/60, 20/70 (new hire)	N/A	N/A	20/40
binocular	N/A	20/100	20/100	N/A
<u>Peripheral</u>	N/A	70°	140°	70°
<u>Color</u>	Red, Green, Blue	Red, Green, Yellow	N/A	Red, Green, Yellow
2. Hearing	25 dB @ 500, 1,000, or 2,000 Hz <u>and</u> avg. 45 dB @ all four frequencies including 3,000, 4,000, & 6,000 Hz	25 dB @ 500, 1,000, or 2,000 Hz 35 dB @ 3,000 Hz <u>or</u> 30 dB @ 500, 1,000, or 2,000 Hz <u>and</u> avg. 30 dB for all four frequencies	25 dB @ 500, 1,000, 2,000, or 3,000 Hz <u>or</u> 30 dB @ 500, 1,000, or 2,000 Hz <u>and</u> avg. 30 dB for all four frequencies	Avg. 40 dB @ 500, 1,000, & 2,000 Hz
3. Weight	Height/Weight Chart Or 18% BFC for males 25% BFC for females	Case by case	N/A	N/A
Physical Agility	Yes	Yes (new hires)	N/A	N/A
4. Blood Pressure	160/110 consistently (absolute)	N/A	N/A	160/90 consistently (relative)
5. Treadmill	Case by case	Yes (new hires)	N/A	N/A
6. Chest x-ray Frequency	20-40 yrs. q. 3 yrs. 40 yrs. & up q. 2 yrs.	q. 5 yrs.	N/A	N/A
7. Physical Frequency	20-30 yrs. q. 3 yrs. 30-40 yrs. q. 2 yrs. 40 yrs. & up q. yr.	20-29 yrs. q. 3 yrs. 30-39 yrs. q. 2 yrs. 40 yrs. & up q. yr.	20-29 yrs. q. 3 yrs. 30-39 yrs. q. 2 yrs. 40 yrs. & up q. yr.	Annual
8. Retention Standards	Yes-Different	Yes-Different	Yes-Same	Yes-Same

Table 2
Comparison of Agility Tests

Sweetwater	St. Paul	Owatonna	Alexandria	Combat Challenge
Stair Climb	35' Ladder Raise	Hose Roll Load	35' Ladder Raise	Stair Climb w/HR Pack
Ladder Climb (24')	Hydrant Prop	Hydrant Hookup	Stair Climb w/HR Pack	Hose Pull
Hose Pull by Rope	Hose Drag	Room Search	Forcible Entry Simulator	Forcible Entry Simulator
Charged Hose Drag	Chop Prop	Hose Drag	Charged Hose Line Drag	Hose Stream Target Backstop
Ladder Raise	Ladder Carry	Ladder Climb	Hose Stream Target Backstop	F/F Rescue (175#)
Pike Pole Pull	Attic Crawl	Stair Climb	F/F Rescue (175#)	
Ventilation Drill	Dummy Drag	Hose Line (charged)		
Search Drill		Attic Prop		
Rescue Tool Carry		Dummy Drag		
Connecting Hose				
		Time limit: 7:20 mins., SCBA, no mask	Time limit: TBA SCBA, w/mask	Time limit: 7:00 mins., SCBA, w/mask

Table 3
Frederick County Physical Agility Tests

Old	New	Change
Stairwell/Standpipe Carry	Hose Carry	Same
Hose Hoist	Hose Pull	Same
Container Loading	Dummy Rescue	Different
Hammer Swing	Chopping	Same
Aerial Ladder Climb	Ladder Raise	Different
Time limit: 11 minutes SCBA, no mask New hires only	Time limit: 10 minutes SCBA, no mask New hires & incumbents	

Table 4
Summary of 1996 Medical Examinations for
Frederick County Career Firefighters (N-36)

Item	Number of Firefighters	Percentage of Firefighters
No adverse conditions	9	25%
Weight increase	27	75%
High blood pressure	3	8%
High cholesterol	9	25%
High glucose	2	6%
Body fat > 30%	5	14%

Average weight gain over previous year: 13 pounds

Range of weight gain over previous year: 2 pounds to 37 pounds

Figure 1
Physical Agility Test Results

Paste-up

Figure 2
Physical Agility Test Results

Paste-up

**APPENDIX A
POLICIES AND PROCEDURES
FREDERICK COUNTY, MARYLAND**

Department: Fire/Rescue Services

No: 959

Division: Public Safety

Page: 1 of 4

Date: May 5, 1997

Approval: _____

Subject: Medical/Physical Standards

A. PURPOSE – To establish medical/physical standards for all career and part-time firefighters.

B. APPLICABILITY – All entry-level and incumbent career and part-time firefighters, including the following employees who are part of the uniformed services group of the Frederick County Employees Retirement System:

Fire Sergeant
Firefighter III
Firefighter II
Firefighter I
Firefighter Recruit

C. DEFINITIONS

1. Medical Examination – A clinical evaluation by the County Contract Physician of an individual's medical and physical ability to perform the essential tasks of the job in required working conditions.
2. Physical Agility Test – A validated test of Firefighter physical performance ability that measures strength, endurance and flexibility. The test consists of five job-related tasks which must be completed within a ten-minute period.
3. County Contract Physical – A licensed physician who certifies whether or not a Firefighter candidate or incumbent is physically fit to perform the full duties of a Firefighter employed by Frederick County Government. The physician must be currently licensed by the State of Maryland to practice medicine and contracted by Frederick County Government.
4. Medically Acceptable – The individual is certified as medically and physically fit to perform the full duties of a Firefighter employed by Frederick County Government conditional upon passing the Physical Agility Test.

**POLICIES AND PROCEDURES
FREDERICK COUNTY, MARYLAND**

Department: Fire/Rescue Services

No: 959

Division: Public Safety

Page: 2 of 4

Date: May 5, 1997

Approval: _____

Subject: Medical/Physical Standards

5. Medically Not Acceptable – The individual is certified as medically and physically unfit to perform the full duties of a Firefighter employed by Frederick County Government based on disabilities that bear a demonstrable relationship to the job.

D. POLICIES

1. All career and part-time Firefighters shall be required to meet the minimum medical/physical standards and requirements for their own protection and the safety of the customers they serve.
2. All career and part-time Firefighters shall be required to pass periodic Medical Examinations as follows:
 - a. Age 29 and below – Every three years
 - b. Age 30 to 39 – Every two years
 - c. Age 40 and above – Every year

When required under the schedule, medical examinations will immediately precede the annual Physical Agility Test.

3. All career and part-time Firefighters shall be required to pass annually the Physical Agility Test.

E. RESPONSIBILITIES

1. All career and part-time Firefighters are responsible for maintaining physical fitness.
2. The County Contract Physician is responsible for conducting the Firefighting medical/physical acceptability of individuals for the position of Firefighter.
3. The Deputy Director of Operations is responsible for coordinating the administration of the Firefighter medical/physical standards, including the Physical Agility Test.

**POLICIES AND PROCEDURES
FREDERICK COUNTY, MARYLAND**

Department: Fire/Rescue Services

No: 959

Division: Public Safety

Page: 3 of 4

Date: May 5, 1997

Approval: _____

Subject: Medical/Physical Standards

F. PROCEDURES

1. All career and part-time Firefighters will receive a medical examination during the first year of this policy. Administration of subsequent medical examinations will follow the schedule determined by the Firefighter's age.
2. All career and part-time Firefighters who are deemed medically acceptable by the County's contract physician will receive the Physical Agility Test after the medical examination during the first year of this policy and annually thereafter.
3. Career Firefighters who are deemed medically unacceptable by the County's contract physician based on the results of the medical examination during the first year of this policy will be counseled and given a maximum of one year until re-examination. Medically unacceptable career employees may use their accrued annual or holiday leave, unless sick leave during the period is recommended by the employee's physician. Career Firefighters who are deemed medically unacceptable by the County's contract physician based on the results of the re-examination after a maximum of one year will be separated from employment.
4. Part-time Firefighters who are deemed medically unacceptable by the County's contract physician based on the results of the medical examination will be separated from employment.
5. All medically acceptable career and part-time Firefighters will be permitted one practice Agility Test after the medical examination during the first year of this policy.
6. Career and part-time Firefighters who fail the first Agility Test will be permitted one re-test on another date after a mandatory second practice session. Incumbents who decline a re-test after failing the first test or who fail the re-test will be separated from employment. The re-test must occur within six months of the first test.
7. Additional procedures are outlined in the attached Medical/Physical Standards for Firefighters.

DEPARTMENT OF FIRE/RESCUE SERVICES

Frederick County, Maryland

MEDICAL AND PHYSICAL STANDARDS FOR FIREFIGHTER

(revised 5/5/97)

A. BACKGROUND:

The Department of Fire/Rescue Services (DFRS) desired to establish medical and physical standards for its Firefighters. Medical and physical standards and requirements were reviewed from the following sources:

- Montgomery County, Maryland DFRS
- Fairfax County, Virginia Fire and Rescue Department
- National Fire Protection Association (NFPA) 1582 Standard for Medical Requirements for Fire Fighters
- U.S. Department of Transportation Physical Qualifications and Examinations of Drivers

Based on a review of the standards and requirements, it was recommended that Frederick County adopt, with some modifications, the medical and physical standards for Montgomery County Firefighters.

B. MEDICAL STANDARDS:

A licensed physician certifies whether or not an individual is physically fit to perform the full duties of a Firefighter employed by Frederick County Government. The physician must be currently licensed by the state of Maryland to practice medicine and contracted by Frederick County Government. The current contractor until October 1997 is Roger H. Halterman, M.D. of Adventist Intermediate Care, 150 Baughman's Lane, Frederick.

The medical and physical standards for entry-level and incumbent firefighters are the same. A Medical Examination of each individual is conducted using valid, useful and nondiscriminatory procedures. The purpose of the medical examination is to identify any medical conditions likely to inhibit work performance or contribute to work-related disabilities.

The medical examination protocol outlines the techniques for the clinical evaluation of the individual's medical and physical ability to perform the essential tasks of the job in the required working conditions. These protocols are based upon a validated job analysis and utilize tests that are sensitive and reliable. Examinees are immediately notified of significant abnormal results and may be required to undergo further evaluation by their private physician or a specialist.

The medical examination protocol for Frederick County Firefighters includes the following:

Medical History Questionnaire
General Physical Examination, Height, Weight, Blood Pressure
Multi-Chemistry Blood Panel
Hematology
Urinalysis with microscopy
Visual Acuity, Peripheral Vision, Color Vision
Audiogram
Spirometry (Pulmonary Function)
EKG
Chest Xray
Monitored Treadmill Exercise Test
PPD
Hepatitis B Vaccine/Titer

Specific medical standards include the following:

1. Weight Standard - Body Mass Index less than 25.

The Body Mass Index (BMI) shall be used to assess body weight. BMI is body weight in kilograms divided by height in meters squared.

Federal guidelines suggest that individuals should maintain their BMI under 25. The goal of DFRS is that its personnel meet this guideline. DFRS personnel with a BMI of 25 or higher shall receive counseling from the county physician.

Obesity shall also be evaluated according to any associated medical conditions and/or the impact of obesity on exercise tolerance or functional ability to perform essential job tasks requiring stamina, dynamic strength, explosive strength, and awkward body positions.

2. Vision Standard - Corrected to 20/30 binocular or better.

a. Distance - The corrected visual acuity shall be 20/30 binocular or better. Visual acuity is confirmed by the Bailey-Lovie Chart. A requirement for a particular acuity level is not met unless the individual reads four of the five letters on that line correctly.

Visual acuity corrected by surgery needs individual evaluation. Strabismus, phorias, or corrected acuity of 20/50 or worse in one eye requires further evaluation to determine loss of binocularity. Anomalies of depth perception are not significant. Monocular vision (corrected visual acuity of 20/200 or worse in one eye) is unacceptable.

b. Peripheral - Peripheral field of vision must be at least 70 degrees in the horizontal meridian of each eye. Peripheral vision of each eye is measured separately by means of automated perimetry. Soft contact lenses may not be colored as they impair visual fields.

c. Color - Color vision must be adequate to distinguish red, green and yellow. Color vision is assessed with the Titmus Test #4 (Cat #SCI-1), a yarn test, or other device to determine ability to distinguish red, green and yellow.

3. Hearing Standard

Pure tone thresholds in the worst ear must not be worse than 25dB at 500 Hz, 1000 Hz, or 2000 Hz and not worse than 35 dB at 3000 Hz, or pure tone thresholds in the worst ear must be no greater than 30 dB at any of the first three frequencies (500 Hz, 1000Hz, and 2000 Hz) and an average of 30 dB for the four frequencies (500 Hz, 1000 Hz, 2000 Hz, and 3000 Hz).

Pure tone thresholds are measured as the lowest intensity of each tone that is barely audible. Pure tone tests measure hearing loss in decibel units. A pure-tone audiometer is used to test air conduction in each ear separately. Testing is conducted in an ANSI approved booth with equipment calibrated to ANSI standards. Testing is conducted under physician supervision and by a person certified by the Council for Accreditation in Occupational Hearing Conservation. Individuals are tested without correction or amplification devices. The ear canal is inspected for occlusions.

4. Treadmill Standard

- Required for all Firefighter candidates, who must have an exercise capacity of 10 METS (9.2 min.) on a monitored treadmill using BRUCE protocol with a cutoff target heart rate of 90 percent maximum heart rate adjusted for age.

- Case by case for incumbents younger than age 40.

- Annually for incumbents age 40 and older.

5. Chest Xray

- Required for all new hires.

- Required every five years for incumbents.

6. Physical Examination Schedule Standard

- Age 29 and under: Every three years.
- Age 30 to 39: Every two years.
- Age 40 and above: Every year.

7. Vaccine Standard - All employees shall be offered and provided, upon their request, the following and any other vaccines, as recommended by the Immunization Practices Guidelines published by the Centers for Disease Control:

Influenza Immunization
Pneumoccal Vaccine
Hepatitis B Vaccine and Titer
Measles Vaccine
Rubella Vaccine
Tetanus Toxoid
Diphtheria Toxoid

7. Physical Agility Standard

- Required to pass for Firefighter candidates.
- Required to pass annually for incumbents.

8. Medical Qualification (Medically Acceptable)

Medical Qualification is determined by the County Contract Physician on a case by case basis after review of the medical and occupational history, medical examination findings, physical and medical testing results, and, if necessary, consultations with specialists and the examinee's private physician. If a medical condition or functional impairment is identified, the County Contract Physician considers the diagnosis, treatment, and prognosis including severity and stability, whether the condition has been controlled or not and if so for what length of time; how well the individual has accommodated to the condition, and prospects for recovery. The County Contract Physician then reviews medical guidelines developed by a consensus of medical experts that identify the working conditions and physical demands known to impact adversely specific bodily states. This information is then correlated to the essential physical demands and working conditions of Frederick County Firefighters. The County Contract Physician also considers the degree of risk to the health and safety of the examinee, coworkers and the public.

The County Contract Physician recommends the entry level or incumbent Firefighter as Medically Acceptable if no significant condition or functional impairment is identified that poses an unduly high risk of injury, aggravation or precipitation of a physical condition, or conflicts with the examinee's ability to perform safely and efficiently the

essential physical demands and working conditions of the job. Medically Acceptable means the individual is certified as medically and physically fit to perform the full duties of a Firefighter employed by Frederick County Government conditional upon passing the Physical Agility Test.

9. Medical Disqualification (Medically Not Acceptable)

Only those disabilities that bear a demonstrable relationship to the job may be used as a basis for Medical Disqualification. A Medical Disqualification based upon a future risk requires a high degree of probability of injury within a reasonable period of time and the risk must be related to the job or job environment. The County Contract Physician may recommend a candidate as Medically Not Acceptable under the following provisions:

- Failure to meet validated vision or hearing standards.
- Failure to meet validated physical fitness qualifications after a reasonable time for training and retesting.
- Permanent medical condition or physical impairment that would hinder or prohibit satisfactory performance of the essential job tasks or significantly jeopardize the health and safety of the individual or others.

In the event of Medical Disqualification, the County Contract Physician notifies the Department of Personnel of the reason for Medical Disqualification and identifies the functional limitations and work restrictions necessary, if any. Prior to making a final employment decision based upon the medical recommendation, the Department of Personnel, in consultation with the DFRS, determines whether or not the essential functions of the job can be accomplished with or without Reasonable Accommodation. It is determined whether or not the requested accommodation is reasonable and imposes no "undue hardship" on business operations.

Medical records pertaining to medical and physical evaluation are confidential and are stored securely separate from personnel records in the Department of Personnel.

C. PHYSICAL STANDARDS:

All physical standards for Department of Fire/Rescue Services (DFRS) Firefighters are bona fide occupational standards and meet the requirements of validity, utility and minimum adverse impact. Physical standards are based upon a validated job analysis of incumbent Montgomery County, Maryland Firefighters and a consensus of expert opinion in occupational medicine and selection procedures.

All personnel are required to pass physical agility/fitness testing that measures strength, endurance and flexibility. The purpose of the testing is to determine an individual's physical or functional ability to perform the essential physical demands of the job and to reduce the probability of work-related disabilities. Tests selected meet the requirements of validity, utility and minimum adverse impact.

Testing is based upon a validated job analysis of incumbent Montgomery County Firefighters that identified the degree of physical ability required to perform critical tasks. Cutoff scores have been set at a point that allows performing the test in a safe and efficient manner. The cutoff scores are high enough that minimum standards of job performance are met.

Individuals are notified in advance of testing requirements and are provided the opportunity to obtain training advice. Physical fitness testing is measured by trained occupational health personnel under the supervision of a physician. Physical agility testing is measured by trained DFRS personnel at the Public Safety Training Facility after medical clearance of the individual.

The Physical Agility Test consists of five tasks that must be completed within a ten minute time period. Each task must be completed prior to the examinee moving on to the next task. The examinee must perform each of these tasks while wearing the firefighter protective clothing and the breathing apparatus that is provided. The examinee is not required to breath from the apparatus; however, it must be carried on the back with the facepiece hanging from the neck.

All field personnel are required to perform successfully the following validated Firefighter Physical Agility Test:

The following tasks are performed wearing full turnout gear, gloves, helmet, coats, boots, and self-contained breathing apparatus. Personnel shall wear, but not use the SCBA facepiece. Each task is performed sequentially and immediately following completion of the previous task. Total elapsed time for the test is 10 minutes.

1. **Ladder extension** - Standing at the start line, walk to a 35 foot extension ladder which is lashed to the fire escape at the side of the five story tower building, extend the fly section of the ladder hand over hand, engage the dogs, and retract the ladder without allowing the rope to slip through the hands.
2. **Hose carry** - Carry a 75 pound standpipe hose pack to the fourth floor of the tower building and deposit it on the floor.

3. **Hose pull** - Pull a section of 2 1/2 inch hose, including brass couplings (52 pounds), aided by a hose roller and a 1/2 inch utility line, to the fourth floor fire escape railing. The task is completed when the couplings are lowered to the ground.

4. **Dummy rescue** - Carry or drag a 117 pound dummy from the fourth floor to the exterior of the building. The task is completed when the dummy clears the starting line 40 feet away from the door on the outside of the building.

5. **Chopping** - Using an eight-pound sledgehammer, strike a railroad tie for a total of 30 times, generating as much force as possible.

The Physical Agility Test is completed and the elapsed time ends when the Chopping task is completed.

**DEPARTMENT OF FIRE/RESCUE SERVICES
FREDERICK COUNTY, MARYLAND**

Firefighter Medical Protocol Checklist

NAME _____

DATE _____

Physical Exam

Urinalysis Complete

Vision (Distance, Peripheral, Color)

Hearing

Chest Xray (every five years)

Blood Work (CBC, Chem Profile)

Pulmonary Function

EKG

Treadmill

PPD Status (Certify)

Hepatitis B Status (Titer)

Other

**POLICIES AND PROCEDURES
FREDERICK COUNTY, MARYLAND**

DEPARTMENT: Fire/Rescue Services

NO: 959

DIVISION: Public Safety

PAGE: 4 of 4

DATE: May 5, 1997

APPROVAL : _____

SUBJECT: Medical/Physical Standards

G. ATTACHMENTS

1. Medical/Physical Standards
2. Firefighter Medical Protocol Checklist

**DEPARTMENT OF FIRE/RESCUE SERVICES
FREDERICK COUNTY, MARYLAND**

FIREFIGHTER AGILITY TEST OPERATIONAL PROCEDURES

(revised 5/5/97)

This document outlines the procedures for administering the Firefighter Agility Test. These instructions must be strictly adhered to. Failure to follow these instructions could result in a misrepresentation of this exam.

Instructions shall be read to each examinee prior to each practice and testing session. The examinee will be given time to ask any questions they have regarding the procedures. Once testing has commenced, the examinee may not ask any questions or receive any additional information. At the end of the exam, the examinee may be given the total elapsed time they used. This time does not indicate and should not infer any determination as to the outcome of the exam.

INSTRUCTIONS

(to be read to examinees immediately prior to administration of the Physical Agility Test)

The Physical Agility Test is a validated test that consists of five tasks which must be completed within a ten minute time period. Each task must be completed prior to your moving on to the next task. You must perform each of these tasks while wearing your Firefighter protective clothing as follows:

- Helmet
- Nomex Hood
- Turnout coat
- Turnout pants
- Knee boots
- Gloves
- 30 minute air mask assembly (supplied by the County)

All clothing and equipment shall meet current National Fire Protection Association standards and must be approved by the evaluator. You are not required to breathe from the air mask; however, it must be carried on your back with the facepiece hanging from your neck.

The test will stop when one of the following occurs:

- 1) you successfully complete the test within the specified time limit;
- 2) you state to the evaluator that you want to quit;
- 3) you fail any of the five tasks;
- 4) you fail to complete the test within the time limit;
- 5) the evaluator stops the test for safety reasons, such as inclement weather.

The evaluator will not tell the you how to perform the tasks, but simply state what tasks are to b completed. You may not ask any questions during the test, nor will the evaluator provide any information during the test. At the end of the exam, the evaluator will give you your elapsed time. If a failure occurs, you have the option of being retested on another date after a practice session if you desire.

The tasks to be performed are as follows:

1. Ladder Extension - Upon the evaluator's command, you will begin at the starting line and proceed to the base of the fire escape. You will fully extend and lock the 35 foot extension ladder that is supported in a vertical position. You must pull the rope to extend the fly section of the ladder while standing in an upright position. You will use your upper body strength to complete this evolution. Your legs may be slightly bent for balance, but should not be used to assist with pulling the rope. You may be told by the evaluator to raise or lower the ladder when the ladder is fully extended to assist with locking the fly section. Once the ladder is fully extended and locked, you will lower the fly section upon the evaluator's command.
2. Hose Carry - You will immediately proceed to the 75 pound hose pack at the base of the Tower Building and carry the hose pack to the fourth floor landing of the Tower. Once you reach the fourth floor landing, you will place the hose pack in the designated area on the floor. You may carry the hose pack in any manner you wish providing that the pack remains off the ground. If you loose contact with the pack at any time during the carry, you will be disqualified.
3. Hose Pull - You will immediately proceed to the landing of the fourth floor fire escape. A rope runs over a hose roller on the railing and onto the ground and is attached to 50 feet of 2 and 1/2 inch hose and couplings weighing a total of 52 pounds. You must pull the rope until the hose touches the roller. While performing this task, you must remain within five feet of the hose roller. A line is marked on the floor to reflect the limit. You must use a hand over hand method for pulling the rope. You may also brace yourself against the railing with either foot to allow more stability. Once the rope has touched the roller and upon the evaluator's command, you must then lower the rope to the ground using the hand over hand method without allowing it to slip through your hands. Allowing the rope to slip through your hands is grounds for disqualification. You may use your foot to stand on the rope during rest periods if you wish.

4. Dummy Rescue - You will immediately proceed to the 117 pound dummy that is on the fourth floor of the Tower Building. You will drag or carry the dummy down the interior stairs to the ground level. At the ground level, you must drag or carry the dummy to the designated point 40 feet from the Tower Building door. You must remain in contact with the dummy at all times. Failure to do so will result in disqualification.

5. Chopping - You will immediately proceed to the railroad tie located at the base of the Tower Building. You must strike the railroad tie 30 times with an eight pound sledgehammer. To perform this task, you must stand in an upright position and strike the railroad tie forcefully with the head of the sledgehammer. The sledgehammer must go over the brim of your helmet with each strike. You must return to a standing position prior to each strike. Each strike must be performed with force. Allowing the sledgehammer to drop onto the railroad tie will not count as a strike. The elapsed time ends when you complete your 30th strike.

If you are showing signs of extreme fatigue, the evaluator may ask you if you desire to quit. If you do wish to quit, you must state "I wish to quit." You will not be encouraged in any way by the evaluator to either quit or continue. If you wish to quit, you must sign the practice/test record sheet in the "comment space" that corresponds to the test which you are taking. The evaluator has the authority to stop the test at any time for safety reasons.

You must understand these instructions prior to participating in this test. Do you have any questions?

DEPARTMENT OF FIRE/RESCUE SERVICES

AGILITY TEST RECORD

Examinee _____ Date _____

Social Security Number _____

The Physical Agility Performance Test has been fully explained and demonstrated to me. In addition, I have been given the opportunity to practice all tasks of the test on at least one prior date. I understand that I must successfully complete each task of the test before proceeding to the next task. I also understand that all tasks of this test must be completed within ten minutes or less and that, should I fail this test, I have the opportunity to retake the entire Agility Test following at least one additional practice session on another date.

Signature _____ Date _____

Test time: _____ Pass: _____ Fail: _____

Comments: _____

Evaluator Signature _____

Evaluator Signature _____